

WHAT IS CLAIMED:

1. A method of removing particulate from a gas stream, the method comprising:
 - (a) providing a gas stream having an inlet plurality of particles having an inlet particle size therein; and
 - (b) passing the gas stream through an acoustic cavity system configured for having energy waves therein to provide an outlet stream having an outlet plurality of particles having an outlet particle size therein, the outlet particle size being greater than the inlet particle size and the outlet plurality of particles being less than the inlet plurality of particles.
2. The method according to claim 1 further comprising:
 - (a) separating the gas stream into a concentrated stream and a cleaned stream, the concentrated stream comprising the outlet plurality of particles.
3. The method according to claim 2, wherein the step of separating the gas stream is done within the acoustic cavity system.
4. The method according to claim 2, wherein the step of separating the gas stream is done downstream of the acoustic cavity system.
5. The method according to claim 2 further comprising:
 - (a) passing the concentrated stream through a particulate removal system to collect the outlet plurality of particles.
6. The method according to claim 1 further comprising:
 - (a) passing the outlet stream having an outlet plurality of particles through a particulate removal system to collect the outlet plurality of particles.
7. The method according to claim 1, wherein the gas stream is an air stream.

8. The method according to claim 7, wherein the inlet plurality of particles comprises liquid particles.
9. The method according to claim 8, wherein the inlet plurality of particles comprise mist particles.
10. The method according to claim 7, wherein the air stream is an intake stream for an engine.
11. The method according to claim 1, wherein the step of passing the gas stream through an acoustic cavity system comprises passing the gas stream through at least two acoustic cavities.
12. The method according to claim 11, wherein the at least two acoustic cavities are in parallel.
13. A method of removing particulate from an exhaust stream, the method comprising:
 - (a) providing an exhaust stream from an engine, the exhaust stream having an inlet plurality of particles having an inlet particle size therein; and
 - (b) passing the exhaust stream through an acoustic cavity system configured for having energy waves therein to provide an outlet stream having an outlet plurality of particles having an outlet particle size therein, the outlet particle size being greater than the inlet particle size and the outlet plurality of particles being less than the inlet plurality of particles.
14. The method according to claim 13 further comprising:
 - (a) after passing the exhaust stream through the acoustic cavity system, separating the exhaust stream into a concentrated stream and a cleaned stream, the concentrated stream comprising the outlet plurality of particles.

15. The method according to claim 14 further comprising:
 - (a) passing the concentrated stream through a particulate removal system to collect the outlet plurality of particles.
16. An exhaust system for an engine, the system comprising:
 - (a) an engine exhaust conduit extending from the engine;
 - (b) an acoustic cavity system configured for having energy waves therein, the acoustic cavity system having an inlet connected to the engine exhaust conduit and an outlet; and
 - (c) an exhaust outlet operably connected to the cavity outlet.
17. The system according to claim 16 further comprising a NO_x reduction device.
18. The system according to claim 16 further comprising a particulate removal system positioned between the cavity outlet and the exhaust outlet.
19. The system according to claim 18, wherein the particulate removal system comprises a particle trap.
20. The system according to claim 18, wherein the particulate removal system comprises a particulate filter comprising media.
21. The system according to claim 16, wherein the acoustic cavity system comprises at least two acoustic cavities.
22. The system according to claim 21, wherein the at least two acoustic cavities are in parallel.